REMARKS/ARGUMENTS

Claims 1-18 were pending in the application; the status of the claims is as follows:

Claims 9 and 11-13 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Application Publication No. 2002/0048425 A1 (previously cited) to McBride et al ("McBride").

Claims 1-4, 8, and 15-18 are rejected under 35 U.S.C § 102(e) as being anticipated by U.S. Application Publication No. 2002/0044721 A1 (newly cited) to Bjorklund ("Bjorklund").

Claims 5-7, 9, 10, and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bjorklund in view of U.S. Patent No. 6,363,183 B1 (newly cited) to Koh ("Koh").

Claims 1, 5, 7, 9 and 15 have been amended to more particularly point out and specify the claimed invention. Claim 13 has been canceled. These changes do not introduce any new matter.

35 U.S.C. § 102(e) Rejections

The rejection of claims 9, 11 and 12 under 35 U.S.C. § 102(e) as being anticipated by McBride, is respectfully traversed based on the following.

McBride shows an electrohydromatic switch including two waveguides (108 and 112) intersected by a channel 102. Switching between the optical wave guides is accomplished by the presence or absence of fluid in the channel. The incoming portion of waveguide 108 addresses the channel at angle greater than the critical angle for the air/waveguide interface. When there is no fluid, the light reflects off that interface into waveguide 112 (paragraph 18). The fluid has a refractive index matching that of the waveguides. When fluid is present at the intersection of the channel and the waveguides, the light will pass through the channel to the outgoing portion of waveguide 108. The movement of the fluid is controlled by actuator 120.

In contrast to the cited references, claim 9 includes:

> a groove intersecting with an optical waveguide and filled with liquid;
> a switching member movably provided in the groove; and
> a micro pump coupled to the groove for transferring the liquid in the groove to cause the switching member to move within the groove in response to pressure applied from the pump via the liquid.

The cited reference does not show or suggest the use of a switching member, but merely uses the presence or absence of fluid. Furthermore, there is nothing in the cited references to suggest that a mechanism of McBride is capable of moving anything other than the fluid itself. The pumping devices shown in McBride use residual charges to allow movement using an applied field. There is nothing in the prior art to suggest that these devices are capable of moving anything more than the fluid itself.

> "A claim is anticipated only if *each* and *every* element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (MPEP §2131, *italics added*)

However, the Office Action states that McBride shows an optical switch comprising: "a groove (102) intersecting with an optical waveguide (108) and filled with a liquid (104); [and] a switching member (126 and 104) movably provided in the groove ..." Thus, one element, liquid 104, is cited as both the switching member and the liquid. Region 126 of McBride cannot meet the limitations of the switching member because it does not move. Liquid 104 cannot meet the limitations of the claim because it cannot cause itself to move. Because the cited reference does not show or suggest a switching member or liquid that meets the claim limitations, the cited reference does not show every limitation of the claim and does not anticipate claim 9. MPEP §2131. Claims 11 and 12 are dependent upon claim 9, and thus include every limitation of claim 9. Therefore, claims 11 and 12 are also not anticipated by the cited reference. Thus, claims 9, 11 and 12 are patentably distinct from the cited prior art.

Accordingly, it is respectfully requested that the rejection of claims 9 and 11 and 12 under 35 U.S.C. § 102(e) as being anticipated by McBride, be reconsidered and withdrawn.

The rejection of claims 1-4, 8, and 15-18 under 35 U.S.C. § 102(e) as being anticipated by Bjorklund, is respectfully traversed based on the following.

Bjorklund shows a device for optical switching using a filter assembly containing a plurality of filters (47, 47', 47", 47"', 47"") capable of selectively reflecting light of different wavelengths (paragraph 37). The filter assembly is selectively positioned in the path of a waveguide 11 and selectively reflected to waveguide 15 or passed to waveguide 13. The filter assembly is positioned by mechanical actuator 21 acting through a member 19. Acuator 21 may be one of several types of devices (paragraph 65).

In contrast to the cited reference, claim 1 includes:

> wherein ... the switching member is moved by applying pressure to a liquid in contact with the switching member.

The cited references do not show or suggest the manipulation of a switching member by applying pressure to a liquid in contact with the switching member. Therefore, the cited reference does not show every limitation of the claim and does not anticipate the claim. Claims 2-4 and 8 are dependent upon claim 1 and thus include every limitation of claim 1. Therefore, claims 1-4 and 8 are patentably distinct from the cited art.

Accordingly, it is respectfully requested that the rejection of claims 1-4, 8, and 15-18 under 35 U.S.C. § 102(e) as being anticipated by Bjorklund, be reconsidered and withdrawn.

35 U.S.C. § 103(a) Rejection

The rejection of claims 5-7, 9, 10, and 14 under 35 U.S.C. § 103(a), as being unpatentable over Bjorklund in view of Koh, is respectfully traversed based on the following.

Koh shows a 2x2 switch 72 actuated by a mirror 96 that is selectively inserted in the path of waveguides 210, 220, 230 and 240. Mirror 96 is actuated by comb driver 300, which operates on the principal of electrostatic attraction (column 8, line 47 – column 9, line 14).

The Office Action states that "Koh teaches that pumps, motors, mechanical actuators, and piezoelectric mechanisms are all equivalent means of displacing a switching member (col. 7, lines 55-bottom)." Applicants respectfully disagree with this interpretation of Koh. Nothing in Koh supports this statement. Koh does state at column 7, lines 47-61 that:

> In general the MEMS sensors and actuators can lead to a completely different class of mechanical, fluid, thermal, optical, biological, and chemical devices and components at micro scale, which would exhibit previously impossible improvements in reliability, performance, and cost. ... Some of the prominent subsystems for MEMS may include: physical (position, velocity, acceleration, and pressure), biological and chemical sensors; motors; valves and pumps; optical mirrors, modulators, scanners, and switches; mechanical actuators, levers, flexures, bearings, hinges, springs, and couplings; seals, interfaces, and packages and others.

However, Koh also states at column 7, lines 61-65:

> Currently there exist a variety of MEMS actuation methods such as electrostatic, magnetic, thermal, shape memory alloy (SMA), impact, and piezoelectric mechanisms and so on by utilizing a wide array of physical effects.

Thus, even though Koh discusses MEMS devices that serve as valves and pumps, there is no discussion of using a fluid driving mechanism in an actuator. This strongly

suggests that an actuator using fluids as an actuation mechanism was not known to those skilled in the art. This is further evidenced by the fact that McBride also does not suggest actuation using a fluid, but rather that the fluid itself is actuated. Therefore, the cited prior art, singly or in combination, does not show or suggest, as in claim 1:

> moving a switching member disposed on an optical path of an optical waveguide, wherein ...the switching member is moved by applying pressure to a liquid in contact with the switching member.

Claims 5-7 and 14 are dependent upon claim 1 and include every limitation of claim 1. Thus, the cited references, singly or in combination, do not show or suggest every limitation of claims 5-7 and 14. To support a *prima facie* case for obviousness, the cited references must show or suggest every limitation of the claim. MPEP §2143.03. Thus, claims 5-7 are not obvious over the cited references.

Also in contrast to the cited prior art, claim 9 includes:

> a groove intersecting with an optical waveguide and filled with liquid;
> a switching member movably provided in the groove; and
> a micro pump coupled to the groove for transferring the liquid in the groove to cause the switching member to move within the groove in response to pressure applied from the pump via the liquid.

As noted above, the cited references do not show or suggest a "switching member" that is actuated by "pressure applied" via the liquid. To support a *prima facie* case for obviousness, the cited references must show or suggest every element of the claim. Therefore, claim 9 is not obvious over the prior. Claim 10 is dependent on claim 9. A claim that depends from a nonobvious claims is also nonobvious. MPEP §2143.03.

Accordingly, it is respectfully requested that the rejection of claims 5-7, 9, 10, and 14 under 35 U.S.C. § 103(a) as being unpatentable over Bjorklund in view of Koh, be reconsidered and withdrawn.

CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment does not increase the number of independent claims, does not increase the total number of claims, and does not present any multiple dependency claims. Accordingly, no fee based on the number or type of claims is currently due. However, if a fee, other than the issue fee, is due, please charge this fee to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260.

Any fee required by this document other than the issue fee, and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee,

and not submitted herewith should be charged to Sidley Austin Brown & Wood LLP's Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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November 11, 2003

DA1 271397v4